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Monstrous Poppy.

THE monstrous poppy described by Mr. Clark in *Science* for Oct. 7 is one of pistillody rather than "gynandry," and it is by no means so new a thing as he supposed. Masters (*Veg. Teratol*, p. 304) describes and figures similar monstrosities, and refers to Goepfert, who, as long ago as 1850, "found numerous instances of the kind in a field near Breslau." This pistillody of the poppy is mentioned also by Frank (*Krankheiten der Pflanzen*, p. 250), who reproduces Master's figure.

CHARLES E. BESSEY.

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Yeasts as Expounded in the "North American Review."

WHY does Mr. Lockwood revive the old idea that yeasts "beget moulds?" In an interesting but inaccurate article entitled "The Hygiene of the Atmosphere" in the *North American Review* for this month there is the following paragraph: "Omnipresent in the atmosphere are the invisible spores of the fungi, know as the *Torulacei*. They beget many of the mould and mildews seen on decaying vegetation. Some of these act also as ferments, decomposing vegetable and animal matter. Of this group, for good and evil, the air almost everywhere contains the spores of *Torula cerevisiae* or yeast fungus, literally the mother of vinegar, alcohol, and leavened bread."

The classical researches of Brefeld and Hansen have long ago exploded the notion that the yeast plant is only an immature form of a species of mould. The terms *Torulacei* and *Torula* are also out of date, *Saccharomycetes* and the generic name *Saccharomyces* being mostly used at present. It is true there is some diversity of opinion as to the systematic position of the yeasts. Some think they constitute a distinct class; the majority of botanists believe, however, that they are degenerated forms of the *Ascomycetes*. There is absolutely no reason for the statement that the mother of vinegar is another form of the yeast fungus. They are by no means different stages of the same plant, and are only related in that they are both fungi. Hansen has proved that *Saccharomyces erevisiae* and *Saccharomyces pastorianus* are beer ferments, and that *Saccharomyces ellipsoidens* is the wine ferment. *Mycoderma aceti* occasions acetic fermentation. Chemically these processes are even more distinct. The former converts certain carbohydrates into alcohol and other products with the evolution of carbon dioxide; while by means of the presence of *Mycoderma aceti* alcohol is oxidized into acetic acid or vinegar. By means of the solid culture media, gelatine and agar agar, introduced for the cultivation of bacteria, white, black, and pink yeasts have been carefully studied, principally by Hansen. Besides budding or gemmation there is another mode of reproduction in the yeasts. The protoplasm of the cell forms spores, and the cell-wall becomes an ascus. They are therefore called ascospores, and the yeasts are considered degraded ascomycetes.

JOHN GIFFORD.

Swarthmore College, Pa., Oct. 8.

BOOK-REVIEWS.

Man and the Glacial Period. By G. FREDERICK WRIGHT. New York, D. Appleton & Co. 1892. 8°. 385 p. Ill.

As a glacialist, the author of this volume stands among the first in this country, and his long study of that remarkable period in the geologic history of our planet invests all he says about it with uncommon authority. In his work, proceeding in a true scientific manner from the known to the unknown, he first describes the main existing glaciers in various parts of the world, and devotes a chapter to the physics of glacial motion. Summing up the signs of past glaciation, he examines separately the ancient glaciers of the Western and of the Eastern Hemispheres, describes at considerable length the drainage systems both in America and Europe, and directs especial inquiry into the cause of the glacial period and its probable date.

All this is well done, and supplies the most compact and satisfactory exposition of our knowledge of the subject which has yet appeared, — the facts carefully stated and the opinions maturely formed. To a very important chapter, and the one which for

many readers will be the most interesting in the book, such unreserved praise cannot be extended. This is the chapter on the "Relics of Man in the Glacial Period." The author believes there are such relics both in Europe and America, and that they have been discovered and proved. No one will deny that there may be such; it is likely enough; but that any such relics have been found under conditions which remove all doubts as to their authenticity and age is open to considerable question.

Confining our attention to examples in the United States, let us see what is offered. His first instance is the rough implements found by Dr. Abbott in the Trenton gravels. But these gravels are unquestionably post-glacial, and no one can say how much *post*. The late eminent glacialist, Dr. Carvill Lewis, considered them rather modern, and also maintained that what Dr. Abbott believed to be undisturbed layers, were those of an ancient talus. These statements Dr. Lewis made at an open meeting of the Academy of Natural Sciences, Philadelphia, not long before his regretted death, concerning specimens from Dr. Abbott which I then laid before the Academy. It is the opinion of most glacialists that the Trenton-gravel finds require further study before we can assign their probable age. I have myself found these chipped stones in the Trenton talus, but never in clearly undisturbed strata.

Dr. Wright's next examples are the finds of rough implements, in the glacial gravels in Ohio, by Dr. Metz, Dr. Cresson, and Mr. Mills. The two first-named are eminent archæologists, but neither is a geologist, and it may as well be accepted once for all that no opinion as to the age of a gravel can be received from any but an expert geologist, one who has specially studied this most difficult subject. Not one of these finds, therefore, is conclusive.

The next example offered is the discovery of flint chips and implements in the alleged glacial gravels by Miss Babbitt, near Little Falls, Minnesota. This locality has been re-examined this year by members of the Bureau of Ethnology, with the result of proving that the implement-bearing layer is unquestionably modern, and not glacial, nor post-glacial.

Next, the alleged implements from the Columbia gravels at Claymont, Del., are adduced. These gravels are far older than the last glacial action, and it would indeed be wonderful were they deposits of human industries. I can say that the discovery of such in them is wholly rejected by McGee and Holmes, who have closely compared all the evidence; and I add that the supposed implements from them which I have examined show no sure signs of human workmanship; while the argillite pieces certainly come from a talus.

The remains under Table Mountain, California, which are next brought forward, have been unanimously denied by archæologists any great antiquity. They belong to a modern industry, and in all probability were left in their shafts by the aboriginal gold-diggers a few centuries before the conquest. The manner of their deposition alone proves this, and the case is given up by Professor Haynes, in his excellent Appendix to Dr. Wright's book.

Dr. Wright's last example is the feeblest of all — the Nampa image, a "beautifully-formed clay image of a female," said to have been brought up from a depth of 320 feet (!) in the boring of an artesian well, at Nampa, Idaho. It is sad to destroy illusions; but when this same image with its story was laid before a well-known government geologist, and he at once recognized it as a clay toy manufactured by the neighboring Pocatello Indians, the person displaying it replied with engaging frankness, "Well, now, don't give me away!"

These are Dr. Wright's evidences of glacial man in America. It will be seen that his structure is rather slight. Very much more solid evidence than any yet brought forward will be necessary to establish this most important fact.

D. G. BRINTON.

AMONG THE PUBLISHERS.

"THOUGHTS of Busy Girls" is the title given to a volume of short essays from the pens of working girls, which Miss Grace M. Dodge, the well-known philanthropist, has edited and prefaced. These essays are quite remarkable, considering the disadvantage-